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MARTIAN POLAR CAPS DECLARED MERE CLOUDS OR HAZE

OK

The famous polar caps of Mars, often attributed to snow or ice that melts seasonally, are largely due to clouds, haze, or other atmospheric phenomena. This is the conclusion of Astronomer W. H. Wright of the Lick Observatory at Mount Hamilton, Calif., who took advantage of the recent nearness of this planet to the earth and photographed it by light of different colors.

It is a comparatively dense atmosphere that envelops the ruddy planet, Mr. Wright has also discovered. Heretofore the general opinion has been that the atmosphere on Mars is very thin.

Using the great Crossley reflecting telescope, these discoveries have been accomplished through the employment of color screens and photographic plates of special sensitivity, the two being used in conjunction with each other in such a way as to isolate, for the purposes of the photograph, light of a number of parts of the spectrum. The range in color is from the near infra-red, 7600 Angstrom units, to the ultra-violet, 3600 Angstrom units.

"It is found that as the color used in the observations approaches the violet end of the spectrum the surface markings of the planet, excepting the polar cap, fade from the image, and in fact dissappear completely with the employment of blue and violet light; the polar cap, for its part, becomes with these changes, progressively more marked," Mr. Wright reports. "If for example, we take light from opposite extemities of the visible spectrum, the infra-red and violet, we find that the one renders a picture rich in detail and high in contrast, while the other supplies an image barren of both, except that the polar cap and a few impermanent features stand out in greater strength. There is another difference between the images recorded by light of these two colors which relates to size. The violet light image is the larger of the two.

"This difference in aspect of the planet when viewed by light of the two ends of the spectrum is interpreted as resulting from the presence of a Martian atmosphere of considerable density that, like the atmosphere of the Earth, scatters and absorbs light of short wave-length, such as blue and violet light, but readily transmits the long-waved infra-red light. The infra-red photographs obviously represent the planet's surface, since they record the familiar permanent markings which are seen in the telescope and are known to be part of the planet; while, considered in the light of the foregoing hypothesis, the violet images are photographs of the planet's atmospheric shell, made with the light that it scatters. The fact that the polar caps are exceptionally strong in the supposed photographs of the atmosphere, leads necessarily to the conslusion that they are, to a great extent, atmospheric phenomena, possibly clouds or banks of haze. These may overlie solid caps of smaller dimensions on the surface of the planet.

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"The difference in size between the violet and infra-red images serves as the basis of a rough estimate of the thickness of the atmosphere, for the diameter of the atmospheric shell must exceed that of the planet proper by twice this quantity. The thickness, or height of the atmosphere derived in this way is somewhat more than 100 miles, but the result is regarded as only roughly approximate, and of value principally in indicating that the extent of atmosphere is measurable."

The significance of the observations is regarded as lying in their indication that the atmosphere of Mars is comparatively dense, optically at least, and of considerable extent. That the planet has an atmosphere has long been assumed, for one seems necessary to account for the waxing and waning of the polar caps.

INSANITY GAS NOT MYSTERIOUS; MANIA IS LEAD POISONING SYMTOM

Acute mania, such as exhibited by the victims poisoned at the Standard Oil Company plant at Bayway, N.J., is known to be a result of acute lead poisoning, Prof. Yandell Henderson, of Yale University, authority on air pollution and poison gases, declared in a statement to Science Service commenting on the danger to the public from tetraethyl lead, the new anti-knock chemical added to gasoline.

"Painter's colic" is the commonest symptom of lead poisoning, but Prof. Henderson said: "A less common result of acute poisoning but one known even by the ancient Greeks and described also by the older authorities in modern times, although rarely seen now, is acute mania with strongly marked optical hallucinations. The victim sees horrible shapes coming after him and becomes very violent. He generally dies. Up to the time of attack he may have felt fairly well and not have realized that he was constantly absorbing lead.

"There is nothing at all mysterious about this insanity gas of Bayway," Prof. Henderson declared. "Among metals of high toxicity lead ranks only a little below arsenic and mercury. It is the most highly cumulative poison known, Individual susceptibility to lead varies more widely than to any other poison. Some persons are affected by slight exposure, others are relatively resistant to large doses. Lead poisoning manifests itself in more different forms than any other intoxication. When contained in food or water it is readily absorbed and in some forms it appears also to be absorbed through the intact skin.

"The total amount that need be absorbed through any channel in susceptible persons is very small in order finally to induce a toxic effect. This effect may appear suddenly without previous warning and then be acute. A single milligram of lead per day for some months may induce illness. Slightly larger amounts for a shorter time have a similar effect. The commonest symptoms are intense abdominal pain, called "painter's colic", muscular paralysis, particularly wrist drop, loosening and loss of teeth, emaciation and abortion in women. Young women are peculiarly susceptible to lead poisoning. Many other constitutional distrubances are also charged to lead.

"The inhalation of volatile substances containing heavy metals always causes far more acute poisoning than does the swallowing of a merely soluble form such as a salt of that metal. This statement does not refer to dusts but to gases truly absorbed through the lungs directly into the blood. The alimentary canal and liver which have the power to stop and hold metallic poisons are thus avoided and the action of the substance is exerted primarily upon the nervous system. The best known example of this distinction is the effect of inhaling arseniureted hydrogen in contrast to that of swallowing the ordinary solid and soluble forms of arsenic. The soluble and volatile forms of mercury show a similar distinction in their behavior. Even metals which when swallowed are practically nonptoxic are poisonous

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The soluble and volatile forms of mercury show a similar distinction in their behavior. Even metals which when swallowed are practically non-toxic are poisonous in volatile form.

"Tetraethyl lead is a liquid. Its vapor may be regarded as virtually volatile lead for the atomic weight of lead is 207 and the four ethyl radicals together weigh only 116. The substance is therefore two thirds lead.

"So far as I am aware no experiments on animals to determine the toxicity of tetraethyl lead have been made. But through various channels which I know to be reliable I have learned from time to time that at practically every stage of the development of tetraethyl lead acute poisonings have occurred, some in the common form and some in the maniacal form. As an expert in this field I should say no animal experiments are needed to prove toxicity, it is extremely unlikely also that any positive remedial treatment can be developed. This opinion is based on extensive experience as physiologist in chief of the war gas investigations, later the Chemical Warfare Service during the war, when I was responsible for a corps of investigators who made tests on animals and men regarding all poisonous gases. There is really nothing at all mysterious about this insanity gas of Bayway.

"The amount of tetraethyl lead added to gasoline is small yet if all cars used it a person on Fifth Avenue, New York, in eight hours would inhale about the minimum amount sometimes inducing symptoms of lead poisoning. I pointed this out to representatives of General Motors two years ago. They claim that most of the lead is accumulated in the muffler of a car and is not discharged. Obviously, however, when a cylinder misfires, as in cars in repair shops and garages, while warming up and even on streets, undecomposed tetraethyl lead may be discharged.

"It is reported that the method of dispensing tetraethyl lead to the public is to attach a small tank of the highly concentrated substance to the gasoline pumps at roadside filling stations. A small amount is added to each gallon of gasoline and it is pumped into the tank of a car. A warning accompanies each tank but the names reported as commonly used for the substance such as ethyl gas and ethyl alcohol are not indicative of an acute poison.

"Lead by preventing premature explosions increases efficiency. It makes possible engines using much higher oompression than at present. The introduction of cars with such engines would put all present automobiles out of date, so that the market could be resold. We should all want one of the new ones.

"I have been trying for many months past to warn the health authorities and the general public of this new hazard. When the outbreak of poisoning at Bayway was reported in the newspapers and when the officials of the company adopted a policy of secrecy I stated that the mysterious insanity gas was tetraethyl lead."

Hot lunches for children in school help to prevent colds.

The American drug trade reached a total volume of $800,000,000 in 1924.

North China is one of the chief oriental markets for kerosene from the United States.

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HUNGARIAN NATURALIST SOLVES CUCKOO'S RIDDLE

The habit of the European cuckoo of laying its eggs in other birds' nests and thus foisting the care of its young upon unwilling foster-parents is not as unnatrual as it has been given the discredit for being, according to Doctor Dobay, a Hungarian zoologist.

Dr. Dobay points out three facts that may help to explain the cuckoo's peculiar conduct.

First, the cuckoo is a great eater. He devours hundreds of insects and worms in a day, This forces him to be a great hunter, constantly on the move. He would probaly be kept on short rations if he and his mate had to stay close to a nest, not to mention the difficulty of getting enough additional food for a hungry family.

Second, Mrs. Cuckoo is strongly against race suicide. She lays from twenty to twenty-five eggs in a season, as against a modest six or eight or ten, produced by other birds. No birds going, no matter how industrious, could feed a family like that. Better make orphans of them, and trust to Providence and the bounty of strangers.

5 Finally, no bird ever sits until she has laid her whole "clutch" of eggs. If the cuckoo waited until all her eggs were laid the first ones would be spoiled before the last were produced and she was ready to incubate them.

It appears, therefore, Dr. Dobay consluded, that the apparently heartless behavior of the cuckoo is the only practical method open to provide for the continued existence of the cuckoo species.

SCIENTIST SAYS TRANSPLANTED EYES ACTUALLY SEE LIGHT

How eyes of rats, cut out of their sockets and then replanted, recover a considerable degree of their normal structure and function is explained by Dr. Theordore Koppanyi of Budapest, working in the physiological laboratories of the University of Chicago under Prof. A. J. Carlson.

Controversy has been aroused by the work of Dr. Koppanyi for the problem is recognized by scientists as an important one, with significance for the future of surgery.

Both Dr. Koppanyi and Prof. Carlson, who has supervised his work, are cautious in their statements; but they point out that two undoubted results have been accomplished.

In the first place, in at least two of the cases they had under experiment, new nervous tissue grew from the cut end of the optic nerve in the eye socket, penetrated the eyeball, and established good anatomical connections, closely resembling the structures to be found in normal eyes. In the second place, when these rats were tested, the transplanted eyes reacted in a normal manner to light. The eyes would move, and the pupils contract, when light was thrown upon them. Blind eyes, with the optic nerve severed or destroyed by disease, do not react in this way.

Dr. Koppanyi related experiments he performed with the rats, to test their

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[illegible] TRANSPLANTED EYES ACTUALLY SEE LIGHT

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Dr. [illegible] experiments [illegible] with the rats, is [illegible] power of sight. Normal rats go away from strong light, while blind rats do not react to light at all. Blind rats placed in a box with a partition, making one side dark, were unable to discriminate between the light and the dark chambers. They walked around in either compartment indifferently. Normal rats remained less than a quarter of a minute in the light before passing through to the dark compartment. Three rats with transplanted eyes behaved in this test like normal rats.

Rats were also tested by placing them ona platform at an elevation of about a foot above the laboratory table. Blind rats do not jump but sometimes crawl down from the platform clinging to the iron rod on which the platform rests, probably guided by the sense of touch. Normal rats and the three spotted rats with transplanted eyes jumped down from the platform. When the platform was raised to a greater height the rats with transplanted eyes showed some hesitation about jumping as though they could see the height and appreciate the risk.

Having succeeded in these preliminary experiments with rats, Dr. Koppanyi is now beginning work on animals with larger eyeballs, using dogs at first, and planning to work on monkeys later on.

Prof. Carlson stated that he believed Dr. Koppanyi succeeded where other experimenters on the same subject had failed, because of two things. The first is the quickness and skill with which Dr. Koppanyi performed the operation. Drying out of the tissues, and especially bacterial infection, which are almost certain to follow even short exposures to the air, greatly increase the chances of failure. Even with the best of methods one success in ten attempts is counted a very good score. The second item in the success of the present experiments is the fact that Dr. Koppanyi sewed the eyelids of his subjects shut until the wounds of the operation healed up, thus preventing the rats from rolling their eyes about in the sockets and increasing the difficulty of reestablishing connections.

Dr. Carlson warned against too easy credence of stories that similar operations have been performed on human beings, and stated that only after many years of cautions experiment and much improvement in methods would it be justifiable to attempt surgical transplantation of the eyeball.

NEW POISON DISCOVERED IN COTTON SEED

"Gossypol," a substance recently discovered in cotton seed, is believed by chemists of the U. S. Department of Agriculture to be responsible for the occasional poisoning of cattle fed on cotton seed. The name of the new poison is derived from "Gossypium," which is the botanical name of cotton. Tests on animals with the pure extract, produced the same symptoms as typical cotton seed poisoning.

Further tests showed that the more poisonous varieties of cotton seed contained higher concentrations of the new substance than did harmless kinds. Cotton seed produced in different regions contains varying percentages of gossypol; cotton seed of the Atlantic coast states contains more than does the seed of the southwest, and cotton seed poisoning of stock is more frequent in the former region.

Examinations of the stomach contents of crows show that about one-fifth of the bird's diet consists of noxious insects.

INSECTS COST AMERICA TWO BILLION A YEAR

Losses equal to $20.00 a year for every man, woman and child in the United States are caused by insects, and the insects are still on the increase, Prof. J. J. Davis of Purdue University says in a report to the Indiana Academy of Science.

The greater abundance of insects now than formerly is explained as due to civilization having brought about unnatural conditions which have interfered with the natural balance among plants and animals. Among the principal causes which have produced this interference, Prof. Davis mentions the extensive and continuour cultivation of the same or related crops, which is favorable to insect reproduction by offering unlimited food supplies continuously year after year. Corn root aphis and corn root worm, for instance, become more severe when corn follows corn.

Another factor, he points out, has been the eradication or reduced supply of the native plants upon which the insects formerly lived. Curculio existed only on wild fruits before cultivated varieties were intorduced, and the rose foot worm which now attacks roses in greenhouses at one time only attacked wild species.

Transportation has also played an improtant part in the spread of insects and more than half of our destructive pests are of foreign origin. They are not necessarily pests of prime importance in their native home, but brought here and finding favorable breedng places with the absence of their natural enemies, they are capable of increasing with scarcely any restriction. Notable examples include the Hessian fly, San Jose scale, Oriental peach moth, currant worm, cabbage maggot, cabbage worm, wheat midge, European corn borer, gypsy and browntail moths, Japanese beetle, cotton boll weevil, pink bollworm and elm leaf beetle.

Even within our own country transportation has had a marked influence on the spread of insect pests. The San Jose scale, first introduced into America at San Jose, California, from China, was carried in shipments of nursery stock across the entire continent to New Jersey, from which place it was soon distributed to many other sections of the country.

Increase in population, reduction of forests, and hunting, Prof. Davis declared, had also helped the insects by reducing the number of birds and animals which feed upon them.

DOVE LOST HUNDRED YEARS ARRIVES AT MUSEUM

After more than a century of oblivion, the Marquesas Island Ground Dove comes to swell the ranks of birds in the U. S. National Museum. It has not been collected since it was first described in 1814. Another new specimen, the Rapa Island pigeon is a fit mate for the Ground Dove as it has previously been known by only one specimen.

The birds are a part of the collections made by the Whitney South Sea Expedition and have been forwarded to the National Museum by The American Museum of Natural History.

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BRITISH MAKE HAY WHEN SUN DOES NOT SHINE

The British Government is taking a keen interest in a process for artificially drying hay or corn that has recently been perfected by the Institute of Agricultural Engineering at Oxford University.

The Process is very simple and inexpensive costing only $200 for installation and $2.30 a ton for operation. This cost remains constant while the cost of naturally drying the hay is $2.70 a ton in a good year and may be $3.60 in a bad year. Air is heated by paraffin fuel and driven into the center of the hay ricks by fans. By this means a rick of from 20 to 25 tons may be dried in eight hours.

GREATEST CAVE IN WORLD EXPLORED

An underworld wonderland surpassing in size, sublimity and beauty anything of the kind hitherto known. Such is the report of Dr. Willis T. Lee who has returned to Washington after a summer spent in surveying and mapping a portion of the caverns which run under the Guadalupe mountains near Carlsbad, New Mexico.

Dr. Lee and his associates, working under the auspices of the National Geographic Society, traced the ramifications of the main cavern, an underground avenue about a half mile wide, for two miles under the mountains. How much further it extends is unknown. A great number of smaller avenues branch off, No attempt was made to follow these.

There is every indication, Dr. Lee said, that the discovery of the Carlsbad Cavern is just a start of the wonders which further exploration of the Guadalupe mountain region in southeastern New Mexico and western Texas will disclose. Texas has already taken steps to set aside her section as a state park. It is probable that the mountains are honeycombed with subterranean recesses, Dr. Lee said.

The most striking feature of the Carlsbad cavern is the extreme delicacy of the architecture of the stalactites and stalagmites in the mammoth chambers. All sorts of fantastic, beautiful designs are worked into the onyx marble.

Dr. Lee found the caverns of Guadalupe mountains the home of a prehistoric civilization. Two skeletons have been sent to the Smithsonian Institution for identification.. Other skeletons, buried in baskets, were found on shelves in the walls. The people who inhabited the caves are believed to have been close relatives of the basket weaving people further west. The caverns are a geological and biological treasure house. There are literally millions of bats, blind crickets, and worms and spiders of hitherto unknown species.

Entrance to the cavern is very difficult. It is necessary to climb 1,000 feet up a mountainside and then go down through a hole in the roof in a guano bucket for 170 feet. A walk of about two miles is then necessary over very difficult flooring before the endof the main cavern is reached. The avenue leads downward through great chamber after chamber until one is 800 feet below the surface of the earth outside. At this point the avenue drops off abruptly 90 feet. This has to be negotaited with a wire ladder. Mr. Lee explored a series of basement chambers never before seen by human eye.

The cavern is in dense darkness. The temperature remains all the time at 56 degrees Fahrenheit.

INDIAN RELICS RESCUED FROM LOSS BY DROWNING

A race between archaeologist and engineer is in progress near Muscle Shoals where Gerard Fowke of the Bureau of American Ethnology of the Smithsonian Institution is rushing the excavation of prehistoric Indian mounds soon to be covered by water backed up by Wilson Dam.

The party of scientist working at the mouth of Town Creek on the Tennessee River has uncovered thousands of implements from the kitchen middens or refuse heaps of ancient Indian villages. Horn instruments were found showing that the matured horn of the Southern deer was used in making arrow head and spear points. It was used in pressing up the edge of freshly splintered flint and in shaping it into arrow heads and spear points. Flint is easily worked with this horn and the bevel edge, which gave the rifle twist to the arrows, was made by these horn in-instruments.

The mound is composed largely of periwinkle shells and thousands of bone-picks used to extract the meat of this snail from the shell have been discovered. Some of these picks have a perforated end for hanging but the majority of them are pointed at both ends.

LOSES SENSE OF SMELL; STUDIES "WOOD PUSSIES"

Skunks in their natural state are to most of us "verboten" material, for close study at least. Our olfactory sense won't stand for it. W. Kenneth Cuyler of the zoology department of the University of Texas, however, isn't troubled that way; having completely lost his sense of smell. He has taken advantage of this unusual "gift" and hunted and studied skunks for many years. He finds they are easily tamed and make fine mousers. Besides mice, they eat all sorts of things from roots, berries and insects to birds and eggs, and sometimes rival the 'possum in their ability to rob the chicken roost.

Mr. Cuyler emphatically denies that the skunk is particularly susceptible to rabies. He himself has been bitten many times, with no more than very temporary discomfort; and a Walker hound of his that he figures has been bitten some 200 times in eleven years is a healthy, active skunk hunter today.

The musk which efficiently definds the skunk from most of us is manufactured by two egg-shaped glands with contractile walls which can force out jets in any direction, even directly over the head of the skunk. These jets break up into a fine spray and can reach an object as distant as twenty feet. Mr. Cuyler says skunks are usally loath to waste their musk and therefore do not discharge it promiscuously, but only when cornered and irritated. If the musk enters the eyes it causes them to burn for a few minutes and the tears to flow, but has no more permanent effect.

For removing skunk odor, Mr. Cuyler suggests washing in gasoline or ammonia water, or in water containing a few drops or carbolic acid and oil of wintergreen. A much more effective method, which he regularly uses, is to hold face or hands or clothing for a few minutes in the thick, heavy smoke produced by placing green juniper branches on a good fire.

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TREE RINGS TELL OF WEATHER CYCLES

Trees as prehistoric almanacs, giving weather reports for ages when there was no other weather bureau to record them, are described by Prof. A. E. Douglass, of the University of Arizona, in the annual report of the Smithsonian Institution.

Prof. Douglass' studies are based on minute examination of annual rings of trees. Beginning with the common knowledge that these rings are formed at the rate of one a year, the light, porous section growing in the spring when there is plenty of water and the denser part when the summer drought comes, he went on to study the effect of years of drought as compared with years of plenty, of accidents to the roots, of fires and of attacks of disease. Every event in the life of a tree left its record in the rings.

After learning the correlation between known historical condtions and comparatively recent tree rings, Prof. Douglass began to carry his researches back into earlier centuries, using trees of the age-old forests of the Southwest as his "time-sticks". Weather records of the time of the discovery of America, of the Crusades, of the Norman invasion of England, and of even more remote periods, can be read on many stumps in California.

One of the interesting pieces of information shared by the trees is a confirmation of the theory of an eleven-year sunspot cycle held by astronomers and weather students. Every eleven years there is a band of relatively narrow rings, indicating a time of heat and drought, with wider rings that tell of easier times in between. Secondary sunspot cycles of longer duration are also suggested by the tree records.

In one of the recently discovered prehistoric pueblos a study of the construction timbers showed what the weather was like when the building was started, how long it took to erect it, and how the work progressed more rapidly at some times than at others. By "matching rings" with beams in another pueblo, it was found that one of the buildings was fifty years older than the other.

Many similar possibilities have been opened up by the development of the method. Perhaps one of the most fascinating is the idea of studying the weather conditions of long past geological ages by the study of rings in fossil trees hundreds of thousands or even millions of years old.

RED STILL LEADS AS MOST POWERFUL SIGNAL

Red, the traditional danger signal, kept its lead as the most easily distinguished from other colors at a distance in the tests for the visibility of traffic signals conducted by the National Bureau of Standards.

Green came second on the list of lights easy to identify while blue ranked third. The ordinary yellow lights were often mistaken for orange or red and a lemon yellow gave better results.

The tests were made under daylight conditions, under which the identification of colored lights is particularly difficult. Several thousand tests were made with different observers. The average showed that a red light of 75 candle power could be identified at a distance of 600 feet, while a green light had to be 250 candle power, a yellow 750 and a blue light 1,000. The observations were made at distances of 600, 900, and 1,250 feet. At 1,250 feet the candlepower required was 1500, 2500, 3000, and 7500 respectively.

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These, tests, for the standardization of traffic lights, are made with the cooperation of the American Engineering Standards Committee, the National Safety Council, and the American Association of State Highway Officials. A committee has been formed to standardize colors for traffic singlas, and for lights for building exits. The problem includes proper traffic signals at road crossings, railroad crossings, and along the highways. The relation of position, number of signals, flashing, and methods of defining colors for signal purposes is also being considered.

BUREAU OF MINES REPORTS NO ILL EFFECTS FROM ETHYL GASOLINE

When tetraethyl lead is added to gasoline in the usual commercial concentration of one part in a thousand automobile exhaust gases result that have produced no ill effects on animals under study by the U. S. Bureau of Mines at Pittsburg, the Bureau has announced.

The government experts point out that the industrial hazard during the manufacture of the anti-knock compund and the possible danger from its use in automobiles are quite different due to the low concentrations in the exhaust gases.

To test the possible hazard due to the exhaust gases from automobiles using ethyl gasoline as ordinarily sold, pigeons, guinea pigs, rabbits, dogs, and monkeys, over 100 animsla in all, were exposed to a definite concentration of exhaust gas from an engine using ethyl gasoline. The concentration of exhaust gas in air used was that which, when coming from the average automobile would be four parts carbon monixide in tenthousand parts of air; a concentration allowable for but a period of one hour exposure from the standpoint of carbon monoxide, and exceeding that known to exist in ordinary traffic of a city street.

Two groups of animals were exposed for daily periods of three and six hours, respectively, and the third group not exposed. The animals were observed throughout the test period of eight months for symptoms of lead poisoning, as colic, paralysis, loss of appetite and loss of weight, and there was no indication of lead poisoning. At various times animals were killed and the entire tissues examined for effects of lead and analyzed for stored-up lead.

Observations made on man showed that most of the lead in exhaust gases coming from ethyl gasoline when inhaled is again exhaled. The investigation indicated the seeming remotemess of any danger of undue lead accumulation in the streets through the discharging of scale from automobile motors.

TABLOID BOOK REVIEW

MARINE PRODUCTS OF COMMERCE.- By Donald K. Tressler, Ph.D. New York, The Chemical Catalog Company, Inc.

Both the layman and the scientist can find knowledge and pleasure in this book by Dr. Tressler. Only simple language is used and when unusual terms are necessary they are clearly defined. It deals principally with the fisheries and fish industries of the United States. It calls attention to the need for chemical and biological research to solve many of the problems of the fishery industries.
